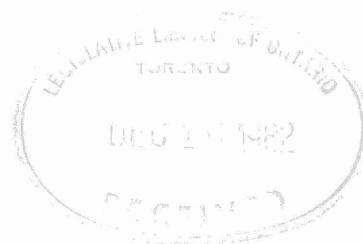


CA20N
EVR 25
1982
R76
C.2

RURAL PCB AND PESTICIDE MONITORING SURVEY
YORK SANITATION LIMITED, STOUFFVILLE



Ministry of the Environment
Central Region
Technical Support Section
Air Quality Assessment Unit

July, 1982

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca

INTRODUCTION:

In March 1982, Central Region performed a study of PCB's (polychlorinated biphenyls) and pesticides in ambient air in the vicinity of York Sanitation Limited in Stouffville. Four monitoring sites were set up and ten samples each were collected from Monday to Thursday during the period March 22 through April 6, 1982.

Samples were collected and delivered daily to the Pesticides Section of the Ministry Laboratory for analyses. All 40 samples were analyzed for total PCB's, total chlorinated aromatics, lindane, and aldrin.

SAMPLING SITE SELECTION:

The sampling stations were selected to achieve a suitable mix of various land use, power supply availability, and reasonable accessibility. The distribution of four air monitoring sites can be referred to in Figure 1. A map of the York Sanitation Landfill Site is presented in Figure 2.

The first station, 48013, was on the York Sanitation property. It was situated southeast of Lagoon 5, a potential source of air contaminants. Station 48014 was chosen to monitor levels adjacent to the landfill site. It was located at the back of the Baker's barn, approximately southwest of Lagoon 5. The third Station 48015, was selected in the nearby Musselman Lake community, approximately 1 mile northeast of the site. The final station was the existing Stouffville Air Monitoring Station 48002 on Highway 47, 1 mile east of Highway 48.

SAMPLING PROCEDURE

Each sampling station was equipped with 2 Nutech low volume gas samplers with florisis cartridges (Figure 3). The installation and the day-to-day operation were carried out by the Air Quality Technicians in the Technical Support Section.

Duplicate samples were collected on 10 week-days (Monday through Thursday) during the period March 22-April 6, 1982. The cartridges, after 24 hours exposure, were changed daily and delivered to the Lab for analyses. Detailed sampling and analytical procedures can be referred to the "PCB's in Ambient Air in Ontario" report published by the Air Resources Branch, namely:

- (a) Development of Laboratory and Field Procedures; ARB-TDA-08-80 Phase I,
- (b) Volume 1; Sampling Site Selection and Analytical Procedure; ARB-011-81-ARSP Phase II.

RESULTS:

A total of 40 samples were analyzed for total PCB's, total chlorinated aromatics, as well as lindane and aldrin. The principal technique used involved the preconcentration of the florisis

cartridges, with subsequent extraction and dual-capillary column GC/ECD (Gas Chromatography/Electron Capture Detector) detection. The quantification of PCB's was based on the 52 predominant isomers, as opposed to the elution pattern matching (with commercial Arochlors) method.

The data was summarized in Table 1. Elementary statistics, which included the mean, standard deviation, standard error, maximum, minimum and range, were presented in Table 2.

DISCUSSION:

No PCB's was detected in 70% of the samples (28 of 40). For the remaining 12 samples, the level was extremely low. The maximum was a mere 1.32 ng/m³, detected at Station 48002 on Highway 47. As expected, all the measured PCB concentrations were well below the Ministry guideline of 150 ng/m³ (24 hour).

The average PCB concentration for all 40 samples was 0.085 ng/m³. The standard deviation was high, indicating a large day-to-day variability in ambient levels. Since the PCB results were extremely low, no rigorous statistical analysis was performed.

In a Province-wide survey conducted in June 1980, an average daily PCB concentration of 0.64 ng/m³ was detected in downtown Toronto. The highest average reading of 1.40 ng/m³ was obtained in London, while the lowest was 0.01 ng/m³ found at the rural site in the Thunder Bay area. (Reference: A Survey of Polychlorinated Biphenyls in Ambient Air in Ontario Phase III; Report ARB-26-81 ARSP Phase III; Air Resources Branch).

The total chlorinated aromatics being measured had a mean daily concentration of 2.64 ng/m³ (40 samples). Like PCB's, there was also a large variability in the data. The samples were also scanned for pesticides. There was no aldrin detected. Only 1 out of 40 samples had a detectable lindane level of 0.04 ng/m³, found at Station 48015 in the Musselman Lake community.

CONCLUSIONS:

Only 30% of the samples (12 of 40) showed the presence of PCB's. The daily mean of 0.085 ng/m³ (40 samples) was well below the Ministry guideline of 150 ng/m³.

The average total chlorinated aromatics concentration (24 hours) was 2.64 ng/m³. Like PCB's, there was great variability in the data collected.

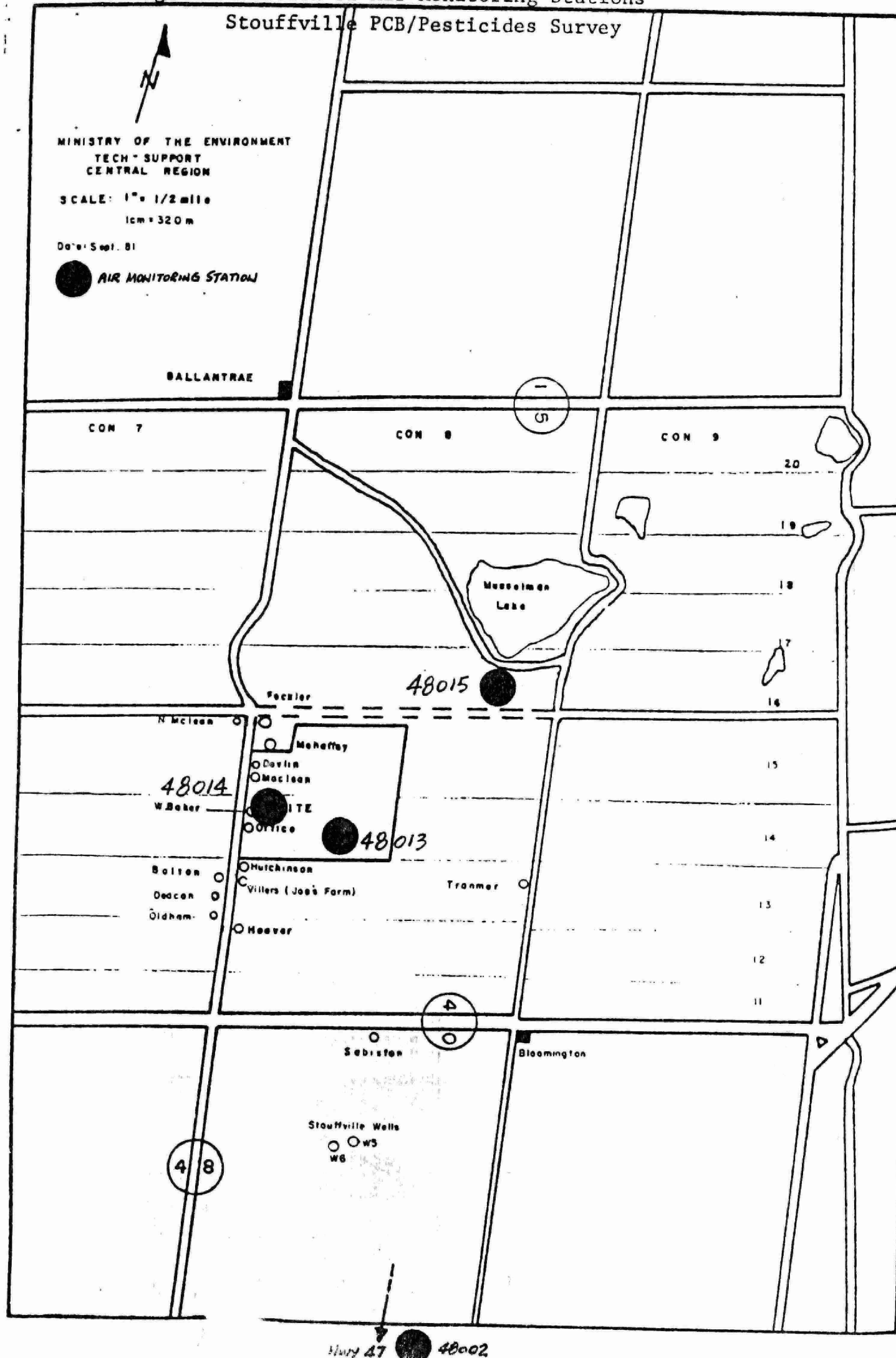
There was no aldrin detected in all 40 samples. Only 1 of the total samples showed a lindane level of 0.04 ng/m³.

Although further sampling can be performed if required, this survey is considered completed at this time.

WFT:cra:REPT1-B

Fig. 1 Location of Air Monitoring Stations

Stouffville PCB/Pesticides Survey



LEGEND

- Well
- OW1-74 Δ Observation Well 1-74
- L5 Lagoon 5 Former Location
- LW5-81 Δ Leachate Well 5-81
- AIR MONITORING STATION

YORK SANITATION SITE No. 4

SCALE: 1 cm = 50 m
1 in = 400 ft

Date Sept 81

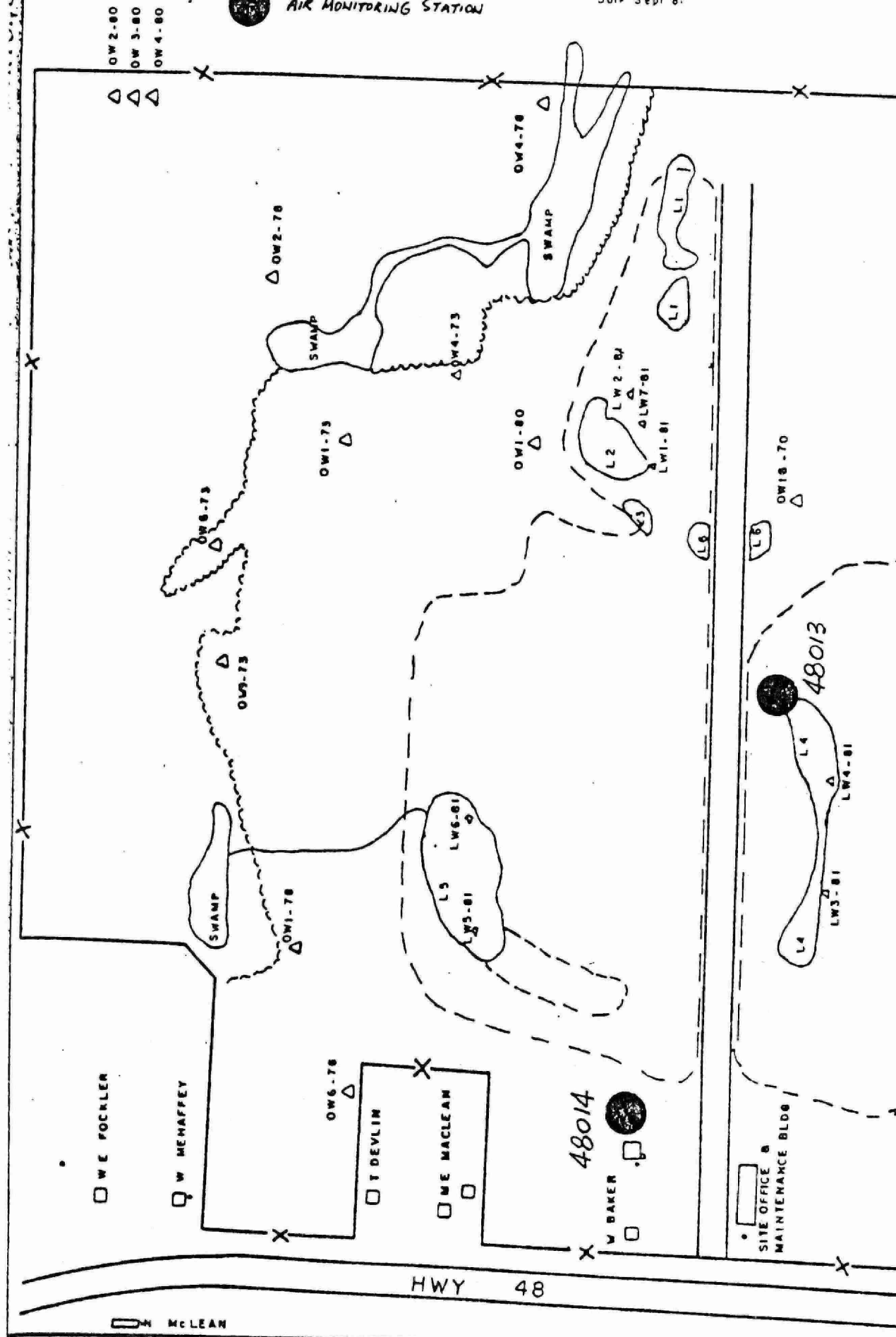
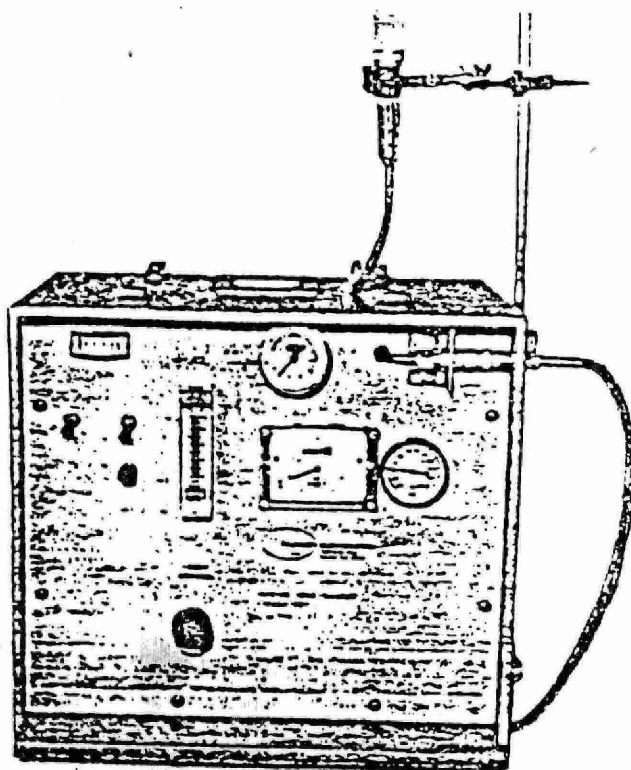
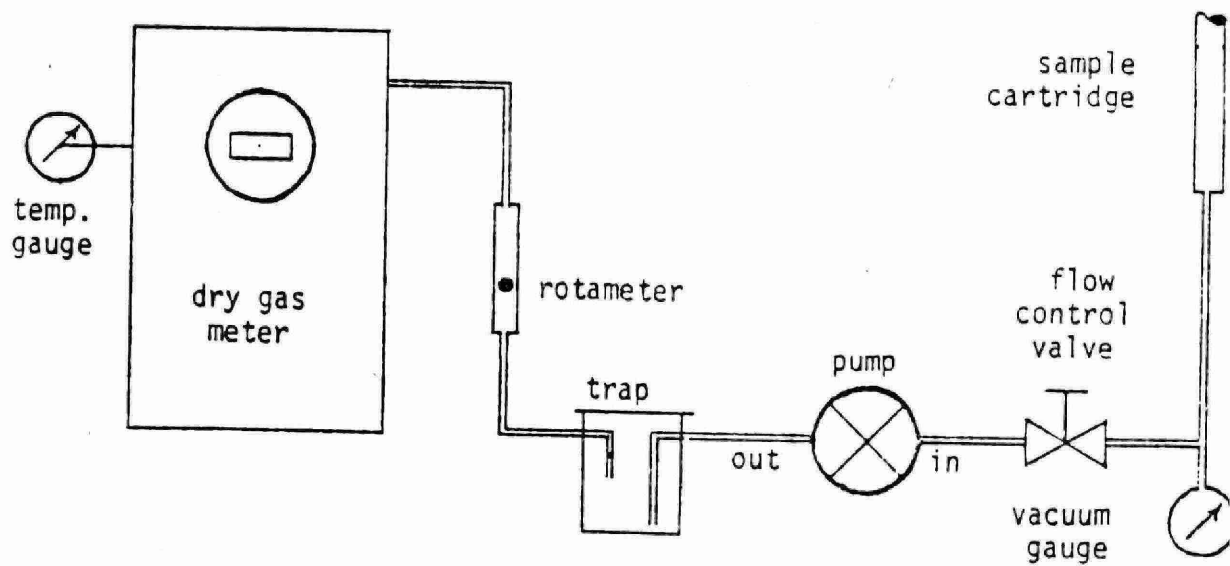


FIGURE 3
NUTECH 221 AC/DC GAS SAMPLER



Reference: Report ARB-011-81-ARSP; Air Resources Branch

DATE	STATION NO.	STATION LOCATION	TOTAL PCB ng/m ³	TOTAL CHLORINATED AROMATICS ng/m ³	LINDANE ng/m ³	ALDRIN ng/m ³	METEOROLOGICAL DATA (TORONTO INTERNATIONAL AIRPORT)
Mar. 22/82	48013	SE LAGOON 5	N.D.	0.20	N.D.	N.D.	sunny/overcast windy
	48014	BAKER'S BARN	N.D.	0.51	N.D.	N.D.	mean temp. 2°C
	48015	VALLEY ROAD	N.D.	3.39	N.D.	N.D.	prevailing wind dir. W
	48002	HWY. 47	N.D.	1.13	N.D.	N.D.	avg. wind speed 22.4 Km/h
Mar. 23/82	48013	SE LAGOON 5	N.D.	3.87	N.D.	N.D.	sunny
	48014	BAKER'S BARN	N.D.	1.63	N.D.	N.D.	mean temp. 1°C
	48015	VALLEY ROAD	0.060	5.31	N.D.	N.D.	prevailing wind dir. W
	48002	HWY. 47	N.D.	6.04	N.D.	N.D.	avg. wind speed 10.9 Km/h
Mar. 24/82	48013	SE LAGOON 5	N.D.	1.23	N.D.	N.D.	sunny/overcast
	48014	BAKER'S BARN	0.09	0.67	N.D.	N.D.	mean temp. 3°C
	48015	VALLEY ROAD	0.08	2.19	N.D.	N.D.	prevailing wind dir. S
	48002	HWY. 47	1.32	4.83	N.D.	N.D.	avg. wind speed 9.7 Km/h
Mar. 25/82	48013	SE LAGOON 5	N.D.	0.78	N.D.	N.D.	overcast/rain/snow
	48014	BAKER'S BARN	N.D.	3.61	N.D.	N.D.	mean temp. 2°C;
	48015	VALLEY ROAD	N.D.	0.50	N.D.	N.D.	precip. 6.4 mm
	48002	HWY. 47	N.D.	2.23	N.D.	N.D.	prevailing wind dir. NNW avg. wind speed 9.6 Km/h
Mar. 29/82	48013	SE LAGOON 5	0.06	8.96	N.D.	N.D.	sunny
	48014	BAKER'S BARN	N.D.	0.28	N.D.	N.D.	mean temp. 2°C
	48015	VALLEY ROAD	0.03	0.91	N.D.	N.D.	prevailing wind dir. SW
	48002	HWY. 47	0.30	16.02	N.D.	N.D.	avg. wind speed 11.0 Km/h
Mar. 30/82	48013	SE LAGOON 5	0.03	0.64	N.D.	N.D.	sunny/showers/mild
	48014	BAKER'S BARN	N.D.	0.36	N.D.	N.D.	mean temp. 5°C;
	48015	VALLEY ROAD	0.49	0.48	N.D.	N.D.	precip. 10 mm
	48002	HWY. 47	0.67	1.59	N.D.	N.D.	prevailing wind dir. SE avg. wind speed 12.2 Km/h
Mar. 31/82	48013	SE LAGOON 5	N.D.	1.25	N.D.	N.D.	sunny/showers/ mild/windy
	48014	BAKER'S BARN	N.D.	0.72	N.D.	N.D.	mean temp. 10°C;
	48015	VALLEY ROAD	0.05	3.86	N.D.	N.D.	precip. 1.2 mm
	48002	HWY. 47	N.D.	1.53	N.D.	N.D.	prevailing wind dir. SSW avg. wind speed 27.7 Km/h
Apr. 1/82	48013	SE LAGOON 5	N.D.	1.77	N.D.	N.D.	cloudy/very windy
	48014	BAKER'S BARN	N.D.	1.41	N.D.	N.D.	mean temp. 1°C
	48015	VALLEY ROAD	N.D.	2.18	N.D.	N.D.	prevailing wind dir. WNW
	48002	HWY. 47	0.22	2.60	N.D.	N.D.	avg. wind speed 33.9 Km/h
Apr. 5/82	48013	SE LAGOON 5	N.D.	3.13	N.D.	N.D.	sunny/cold
	48014	BAKER'S BARN	N.D.	2.78	N.D.	N.D.	mean temp. -5°C
	48015	VALLEY ROAD	N.D.	0.14	N.D.	N.D.	prevailing wind dir. SNE
	48002	HWY. 47	N.D.	0.95	N.D.	N.D.	avg. wind speed 15.9 Km/h
Apr. 6/82	48013	SE LAGOON 5	N.D.	3.09	N.D.	N.D.	cloudy/very windy/ cold
	48014	BAKER'S BARN	N.D.	4.29	N.D.	N.D.	mean temp. -7°C;
	48015	VALLEY ROAD	N.D.	3.42	0.04	N.D.	precip. 1.2 mm
	48002	HWY. 47	N.D.	5.13	N.D.	N.D.	prevailing wind dir. NNW avg. wind speed 34.0 Km/h

N.D. = none de

TABLE 2

PCB AND PESTICIDE (AMBIENT AIR) SURVEY / STOUFFVILLE
=====ELEMENTARY STATISTICS
=====

SAMPLE SIZE : 10

VARIABLE : 1 TOTAL PCB (NG / CU. M.)

2 TOTAL CHLORINATED AROMATICS
(NG / CU. M.)

STATION NO. 43013

LOCATION : YORK SANITATION - S.E. OF LAGOON 5

VARIABLE	MEAN	STD.DEV.	STD.ERR.	MAXIMUM	MINIMUM	RANGE
1	.009	.020	.006	.060	.000	.060
2	2.492	2.577	.815	8.960	.200	8.760

STATION NO. 43014

LOCATION : BAKER'S BARN

VARIABLE	MEAN	STD.DEV.	STD.ERR.	MAXIMUM	MINIMUM	RANGE
1	.009	.028	.009	.090	.000	.090
2	1.626	1.446	.457	4.290	.230	4.010

STATION NO. 43015

LOCATION : VALLEY ROAD - MUSSELMAN LAKE

VARIABLE	MEAN	STD.DEV.	STD.ERR.	MAXIMUM	MINIMUM	RANGE
1	.071	.150	.048	.490	.000	.490
2	2.238	1.734	.548	5.310	.140	5.170

STATION NO. 43002

LOCATION : HWY 47 - STOUFFVILLE

VARIABLE	MEAN	STD.DEV.	STD.ERR.	MAXIMUM	MINIMUM	RANGE
1	.251	.435	.137	1.320	.000	1.320
2	4.205	4.530	1.433	16.020	.950	15.070

ALL STATIONS

SAMPLE SIZE : 40

VARIABLE	MEAN	STD.DEV.	STD.ERR.	MAXIMUM	MINIMUM	RANGE
1	.035	.243	.039	1.320	.000	1.320
2	2.640	2.896	.458	16.020	.140	15.380



96936000009221